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[OFFICIAL NOTICE.]

New England Association of Gas Engineers.

OFFICE OF SECRETARY,
BOSTON, January 8, 1884.

The annual meeting of the Association will be held at Young's Hotel, Boston, on the 20th and 21st days of February next, commencing at 11 o'clock A. M., on the 20th of said month.

Members wishing to propose the names of applicants for membership, are requested to send them to the Secretary two days at least before the time of meeting.

The Board of Directors will meet at Young's Hotel, on the evening of February 19. Papers to be read, other than those presented for prizes, must be forwarded to the Secretary in time to be presented to the directors, at this session, for their approval.

Those wishing rooms engaged, will please notify the Secretary on or before February 16.

At the last annual meeting it was "*Resolved*, That the directors of this Association be instructed to offer three prizes, of such amounts as they may see fit, of a value of not less than $100 for the first, for the best papers offered to the Association at its next annual meeting."

The directors have therefore, with the authority thus given them, voted that the following prizes be awarded: For the best paper $100; for the second in merit $50; and for the third in merit $25. The decision as to the merits of the several papers presented, to be made by one or more experts in the gas profession, not active members of the Association. Each paper must be forwarded to the Secretary one week, at least, before the time of the annual meeting, and bear upon it a motto, and be accompanied with a sealed envelope with a similar motto on the outside, and the name of the author inside. The names of the unsuccessful competitors for the prizes will not be made known, and their envelopes will be destroyed, unopened.

In order that our next meeting may be made more interesting and profitable than those of the past, papers bearing upon subjects relating to our profession as gas engineers, whether for prizes or otherwise, are earnestly solicited.

Nothing conduces so largely to make our meetings of real benefit to our members, and give them something of value to carry back to their several fields of labor, as the reading of good papers containing statements of practical results and experiences, accompanied with advice and recommendations by their authors, and the discussions to which they naturally lead.

Managers, superintendents, and engineers of gas companies are cordially invited to the meeting.

GEO. B. NEAL, *Secretary.*

M. S. GREENOUGH, GEO. B. NEAL. } *Committee of Arrangements.*

ANNUAL MEETING OF THE SAN FRANCISCO (CAL.) GAS LIGHT COMPANY.

The regular annual meeting of the San Francisco (Cal.) Gas Light Company was held in San Francisco on date of January 14, and a very flattering feature of the meeting was the fact that out of a total of 100,000 shares of stock 92,366 shares were personally represented. Before going into any further account of the details of this annual meeting, it will not be in any manner out of place for us to complain of the laxity exhibited by the officials of our gas companies in failing to send us copies of their annual reports. Such documents contain information which is of the utmost value to the fraternity of this country, and the publication of such matter in the columns of the JOURNAL would not, in so far as we can see, prove in any sense prejudicial to the best interests of the companies so reporting. On the contrary, a fair business statement of what had been accomplished during the twelvemonth would go far toward showing that many a supposed "bonanza" in the gas manufacturing line was, in reality, but a moderately rich vein, and possibly might act as a deterrent to "striking prospectors," ever on the alert to locate on a "lode" which had previously been "staked" by some enterprising and hardy pioneer.

This very report under consideration was not received directly by us, but is chiefly derived from a newspaper source, the San Francisco *Bulletin*, which, to its credit be it said, generally strives after accuracy and impartiality.

As said at the commencement, the fact of over nine-tenths of the stock being represented at the meeting augurs well for the interest taken by the shareholders in the future of the company, and furnishes an example that is well worthy of imitation on the part of all those investing money in gas undertakings. Two years ago the representation was 84,226 shares, the showing for the succeeding year being 86,965 shares. President Donahue's report was placed before the meeting and read by the Secretary. It called attention to the largely increased consumption of gas, despite the fact that a competing company had been in the field for the past two years. This increased business had led the management to enter into a contract for the erection of an additional gasholder, at a cost of $30,000. It had also been decided to construct another retort house, which, with the benches, settings, etc., was to be modeled upon the latest and best approved modern plans, the company's engineer, Mr. J. B. Crockett, Jr., having submitted the details of construction to the directors, which were eminently satisfactory. Other improvements were also in progress, not the least being the determination to erect two "Standard" washer-scrubbers of large capacity. Notice was also drawn to the fact that the contracts with the city would expire on May 1st and August 1st respectively. It will be recollected by our readers that the San Francisco Company experienced considerable trouble in its dealings with the municipal authorities during last spring, when the Board of City Supervisors found that, owing to their laviahness, not to call it by any harder title, in spending or wasting the tax levy, they had reached the end of their tether, economized (!) by directing that the greater portion of the street lamps be put out of service. New York city is supposed to have about as rare and choice a body of spirits in command of these things as is to be found anywhere else; but our Gas Commission, we think, would hesitate a long while, and be reduced to very serious straits, before ordering the street lighting stopped, even supposing the pleas advanced were the time-seared and battle-scarred ones of economy and retrenchment.

Despite the drawbacks occasioned by the street-lighting stoppage, and the decision of the courts ordering the payment of back-taxes, in the suit of the city against the company, to the amount of $320,000, the corporation declared and paid four dividends during the year, as follows: One of $100,000, in April; one of $100,000, in July; one of $80,000, in October; and one of $50,000, paid January 1st.

Only two additional miles of mains had been laid during 1883, but there would be a large increase in the mileage during 1884. In conclusion the President stated that he had been connected with the company since its organization in 1852, and had been its President for the past 20 years; while willing to continue in the service of the corporation as director, he thought, on account of his age and failing health, someone else should be chosen as the executive head.

The Secretary's report showed the assets of the company to be estimated at $6,175,784, of which $1,386,000 was in real estate, $2,200,000 in plant, etc., $1,143,000 in mains, $281,788 in coal and other supplies, and $60,108 in cash, the remainder being in bills receivable, etc. The available assets were reported to be as follows:

Coal and other supplies	$281,788
Due from city	119,981
Bills receivable, good	89,430
Cash on hand	60,108
Gross available assets	$551,307
Liabilities	26,741
Net available assets	$524,566

The amount paid for salaries, wages, repairs, etc., was $339,765, being about $11,000 less than the year before, and $25,000 less than the amount disbursed in 1881. The number of consumers had been increased by 1,080 during the last year, while, for 1882, there had been a net loss of 536. The reports of the President and Secretary were approved by the meeting and ordered to be placed on file.

Taking the estimated value of the entire plant and appurtenances of the San Francisco Company as being, according to the Secretary's valuation of $6,175,784, their full worth, it would appear that the corporation suffers considerably in the matter of over-capitalization. We are informed that the capital stock of the company is placed at $10,000,000, which figure presumably was made at the time when "millions" were more easily piled-up in California than now. The duty of the directors in the premises would seem to be a vigorous application of the pruning knife. Cut down the nominal capital to a basis where it will cease to be nominal, and become actual and real. The enhanced price of the new shares would far more than make up the seeming loss occasioned by the lopping-off of the worse than useless excess now carried, and place the company in a position to pay fair and regular dividends. We hope such a step will be carried into effect, and do not for a moment doubt that the policy would be a good one.

Upon going into an election for officers Judge Hager placed in nomination the old board. In response to a request for other nominations, Mr. C. G. Hooker, whom it was thought would present an opposition ticket, made a statement as to his position. He declared that the changes which had been made by the company in the manufacture of gas and the sales of residual products, had proved satisfactory to himself and friends. Mr. O'Connor moved that the Secretary cast the ballot for the old board; the Secretary did as directed, and the President announced the result. The gentlemen elected were, Messrs. Peter Donahue, J. B. Haggin, Thos. Menzies, E. P. Murphy, Joseph Durbrow, E. B. Cotter, and E. E. Eyre. When the directors organized, Mr. E. P. Murphy was chosen President, Mr. Donahue declining a re-election; the other officials selected were, E. E. Eyre, Vice-President; W. G. Barrett, Secretary; J. B. Crockett, Jr., Engineer.

THE MEETING OF THE NEW ENGLAND ASSOCIATION.

We take it for granted that due heed and attention has been given the official notice of Secretary Geo. B. Neal in relation to the annual meeting of the New England Association of Gas Engineers, which event takes place at Young's Hotel, Boston, Mass., on the 20th and 21st days of the current month. More especially is it to be hoped that the excellent step taken by the directors, in offering a series of prizes for the three best papers presented on any subjects connected with the gas industry, will be greeted with the proper share of success. While the money value of the premiums may not be of extraordinary size, there is behind them the satisfaction of knowing that no small degree of merit attaches to the honors of successful rivalry in a competition of this description. Send along your essays, Messrs. Engineers, so that the committee of experts, to be appointed to settle the question of superiority, will find themselves puzzled in deciding who shall be first, second, and third.

Proposed Suit Against the Firm of Brown & Owen.

The counsel for the city of Philadelphia (Pa.) recently had a consultation, the object of which conference was to decide what should be done in relation to leg l proceedings against the firm of Brown & Owen, gas works supply contractors of that city. The outcome of the discussion was that on the afternoon of January 10, City Solicitor West ordered that writs should be issued against the firm of Brown & Owen, as originally composed prior to the time when Thos. R. Brown vacated the post of engineer-in-chief to the works operated under control of the Gas Trust, and also against Thos. R. Brown personally, to recover moneys paid to them by the Gas Trust for materials furnished. The writs were sent to the Sheriff's office for service, the answers being made returnable by the first Monday in February (Feb. 4), when the defendants are required to make plea, either in person or by counsel.

The Philadelphia *Record* states that the City Solicitor deemed it essential to begin the suit at once, because he had an idea that many of the bills for large amounts of money would be barred by the statute of limitations from action if there were any delay.

The basis for the suit is the testimony of R. Pitt Owen, who was in 1876 a partner in the firm of Brown & Owen, and is still a member of the house. Mr. Owen testified that when the firm went into business Thomas R. Brown furnished the capital, and placed his son, Charles Brown, in the house. The profits were divided between Owen, Charles Brown and Mrs. Thos. R. Brown. When the Chief Engineer came into the firm in person the one-third profits which had been credited to his wife were immediately transferred to his name.

The City Solicitor now seeks to recover this one-third of profits which were handed over to Mrs. Thomas R. Brown, and in addition all the money in excess which was paid to the firm over and above what the experts testified at the various hearings, the goods could be purchased for elsewhere. The whole amount involved in the suit is believed to be about $50,000. The exact sum cannot be determined until a thorough overhauling of the books of the firm is made. It is maintained on the part of the plaintiff that an employee of a department cannot take contracts to supply the city while he is in the service of the corporation without incurring great penalties, and that Brown has violated this law in all its forms.

The result of the investigations shows that the total amount of Brown & Owen's bills was $102,266.50. The amount analyzed and compared with market prices was $73,065,85, leaving a balance yet to be compared of $29,200.65.

According to the bills so far analyzed, Brown & Owen received in all $73,065.85. The market price for the goods according to the experts was $42,259.54, leaving an excess over the market price paid to Brown & Owen of $30,806.31. This latter sum is a part of that which the City Solicitor seeks to have returned to the Treasury.

The English Residual Market.

From Messrs. Bradbury & Hirsch's "Annual Review" (Liverpool, Eng.) of the English sulphate of ammonia market for 1883, we glean the following matters of interest:

Writing for so many interests—from the gas lighting industry and the ammonia manufacturer, to the manure and chemical manufacturer and the farmer—our report would lose in interest were we to omit technical and similar matters; and still more so, did we not allude to practical evidences of progress, improvements, inventions, and new scientific facts, which, without having any direct bearing upon the market with which we have mostly to concern ourselves, still have such an undeniably potent indirect influence upon the forces which sway a market, that to leave them aside would dim the perspective, and consequently we should fail to give satisfaction to our readers. We hope, therefore, to attain the latter by pursuing our usual course. As our report must, however, through a plethora of unfortunate circumstances, present such an utter contrast to anything that it has been our privilege to chronicle before, we are afraid it will take a considerable effort to reconcile our present record with that of a year ago, or, indeed, with any of our previous annual issues.

We know from former experience, and it is generally acknowledged, that this market is capricious; that it has many surprises in store, even for those in daily contact with it; that its fluctuations are frequently violent without adequate cause, while at other times the most powerful attributes effect no change in the position of the market. All this we know. Still, during the past twelve months, all experience has been as none; all calculations, all prognostications—nay, even the shadow of an opinion—have been utterly valueless, as well as diametrically opposed to the events which have occurred. Indeed, it cannot be called a change which has come over the market, nor yet can the word "fluctuation" be applied, unless there is to be a new definition of the word, and "fluctuation" is to mean a movement in one direction only. No; we feel compelled to say that, as by an earthquake, the market has been shaken to its very foundation, and has been tottering on the verge of utter collapse; and it has been practically and very clearly shown how little the future can be judged by present appearances.

But before going further we had better, perhaps, endeavor to explain some of the causes which have brought the market down to a price which never could even have been dreamt of a year ago; and although we must necessarily, to some extent, fail to give a satisfactory account, owing to the peculiarity of the circumstances supervening, we will make our record as lucid as we can.

Two causes have almost invariably been cited as a reason for the fall in prices—(1) over-production, and (2) reduced consumption. These, however, we do not agree with; and we will now show that sufficient reasons do not exist for the acceptance of these statements.

In regard to over-production, we cannot trace anywhere the surplus which ought to exist if this theory were a true version; for the actual stocks are certainly insufficient to create even what is termed a weak market. The stock on hand, taken all round, is in reality less than at the same time last year. Moreover, it is in no weak hands; and sellers will only part with it to suit their own convenience. And how is the over-production to be accounted for? We do not find it in England, where the usual bulk has apparently been consumed; and if there had been a largely increased production, there must have been a sufficiently large demand to balance it. There has been about an average increase in the consumption of gas, and a consequently increased output in the quantity of gas liquor; but the latter has all been disposed of. Nor has there been the increase feared about a year ago, in Scotland, from the oil works. On the contrary, any increased production would not be more than adequate to the larger consumption which is taking place in that country, if it can be found even to suffice for the always heavy demand in the spring months—and it will be much heavier in the coming spring—after deducting what has already been sold for export.

And what about the promised increase from coke ovens, furnace gases, etc.? We will refer to these more fully later on. Let us in the meanwhile state that there has been much cry, but little wool; because the actual quantity resulting from these processes forms almost too small a percentage in the total production to cite it as at all having had an effect upon the market.

The production abroad has made no strides. Continental cities and towns, industrial establishments and factories, do not increase in their population and area as rapidly as in this "tight little island." The advance is more gradual. Hence sudden changes, aggravating the position of a market in supply or demand, seldom occur; and preparation can generally be made for an emergency.

Nor do we consider that the future production—leaving aside that from gas works, where the supply of liquor will, no doubt, go on steadily increasing year by year—will turn into an avalanche; because expensive processes, assuming even that they will answer in the majority of cases, will cease to be used, and will certainly not be more widely adopted when once it becomes evident that they are not financial successes. We should therefore require some more substantial facts before assuming over-production as one of the causes of the decline.

Now to consider the reduction of consumption. It is no doubt true that Germany has consumed rather less, which is partly due to the temptations of cheaper commodities—that is, before the prices of sulphate touched the present level—and partly due also to the exceptionally fine agricultural season, which caused an abundant growth even where little or no manure had been used. So we will not, at any rate, take the rate of consumption during last season as a rule by which to measure the future quantity to be consumed.

In any case, as far as exports are concerned, the deficient weight taken by Germany has been fully counterbalanced by the quantity absorbed by France, Spain, and Italy; also by the quantities exported to the Colonies, both in the crude state and as admixtures with guanos and other fertilizers. As regards France, the rapidity with which she has increased and is still increasing her consumption is really wonderful—it has been so spontaneous; for in the autumn of 1882 the first symptoms appeared of her becoming a good, possibly some day our best customer. The advance made in agriculture in France seems much more pronounced even than it was in Germany. It has been a steady march onward in the latter country; it has been a quick-step in France. It has been of more recent date in France; but it looks as if this wonderful country was to leave behind all her neighbors, older in experience, but slower in movements. We have watched Germany almost since her first appearance on our markets—this must be now close upon 25 years—and, comparing her consumption, not of ammonia alone, but of fertilizers generally, during the early years of her adoption of artificial manures, with imports of more recent date, the immense strides made must excite wonder and admiration. We will, however, confine ourselves to sulphate; and it will no doubt surprise many when we state that even ten years ago the imports into Hamburgh did not reach 10,000 tons, while in 1881 they were 30,000 tons.

France seems, until the date mentioned above, to have depended entirely upon her own production of ammonia; and she even did not consume this quantity always, for frequently a large proportion was sold to German and Belgian manure manufacturers. Now, since it has become thoroughly recognized by the French farmers that an outlay for artificial fertilizers is not a dead loss, but an investment of the most valuable kind, it was, of course, at once found that their own production of ammonia was entirely inadequate; and simultaneously their imports of Peruvian guano became of a very low standard. They were quick-sighted enough, in this respect—more quick-sighted than our own agriculturists—to immediately discard the use of a high-priced commodity in its natural state which retained not much more than the name to recommend it, its intrinsic value being out of proportion to its cost. They took either to a guano with a fixed ammonia and a guaranteed strength, or to ammoniacal fertilizers in another shape. A further explanation of a large French trade will be found in the fact of her rapidly increasing production of soda ash; some works of very large dimensions having been erected, especially in the south of France (of course working Solvay's process). And to show the extension of this process, and its future capabilities, we cannot do better than refer to the figures given by Mr. Walter Weldon in his excellent paper on "The Present Condition of the Soda Industry," read before the London Section of the Society of Chemical Industry in January last year. It was stated in it that out of the world's production of soda, 710,000 tons, about 160,000 tons were produced by the ammonia process. It seems also that the process was first worked by the Belgian patentee, in 1869, near Charleroi, where but 180 tons were produced during the first twelve months. It reached about 4,000 tons in 1874; and is fully double that quantity to-day. About 35,000 tons are produced at his Belgian and French works combined. The total production at all this firm's works (including those in Germany) is close upon 80,000 tons, or almost treble that of four years ago. The total French production is 57,000 tons. In England, works were started at Northwich in 1873. The production in 1875 did not exceed 2,500 tons; to-day it is at the rate of not less than 50,000 tons per annum! Germany produces about 45,000 tons. There are in all 19 works in operation; new ones are approaching completion in Germany, Austria, Russia, and the United States; and of course the supply of ammonia required for the process will all have to fall upon gas liquor. It is as well to explain that the bulk of the ammonia used in this process is recovered; but a portion has hitherto always been lost. This Mr. Weldon computes, on the total production of ammonia soda (160,000 tons), to be about 9,000 tons of ammonium sulphate annually.

We have finally to refer to Spain, which seems in a fair way to imitate her French neighbor, and may presently become an important factor in our exports. There is no occasion to specially refer to the other countries. Still, a word about our home consumption. It is pretty clear that more sulphate will be consumed in England and Scotland during the present season than

ever before; and, indeed, this need not be wondered at, since nitrogen, in the shape of sulphate of ammonia, is about the most reliable and most easily manipulated commodity of the day.

We must now leave it to those interested in the matter to decide whether there is any fear of our production not being consumed. The demand has been misjudged because it has been peculiar and petulant; it has apparently not been less.

Of course, after this dissertation, we shall be expected to give an explanation of what we think to be the causes of the great fall in prices; and, in willingly doing so, we hope at least to give sufficiently interesting information, even if our readers choose to differ from us, in respect to the opinions expressed. We will, then, say it has been: (1) The competition of nitrate of soda; (2) the speculative proclivities imported into the trade.

In reference to the competition of nitrate of soda, it seems to have been very late in the day that the fact became recognized in Germany (on the authority of and under the dictation of their analytical chemists) that nitrate was, independently of its cheapness, a more valuable commodity than sulphate of ammonia. The statement was not accepted unconditionally; for, in spite of high sulphate prices, the latter was still bought heavily during the early part of the year. The argument was, however, used at every eligible point, and in a very forcible way, too. It was shown that, calculating the respective cost of the unit of nitrogen in each, sulphate was eminently too dear a commodity; and, backed by the opinions of their chemists, the Germans deliberately stated that if they were to buy sulphate in future, the price must be commensurate with that of nitrate. Consumers of sulphate seem to have done their best to further this end; and had no difficulty in getting importers of nitrate to their way of thinking; so that soon these views were pronounced by everybody, and finally became a kind of *fait accompli*. No wonder, therefore, that sulphate became—judged superficially—neglected, and was placed in a worse light even when nitrate declined.

The circumstances naturally frightened sulphate makers, causing great pressure to sell; and the natural consequence was a sharp decline in prices. It need hardly be mentioned here that speculators in sulphate used every step downward in nitrate for their own purposes, and it has become the fashion now to regulate quite mechanically the prices of sulphate by those of nitrate. The decline has been further aggravated by the extremely heavy shipments of nitrate, which in themselves had a very depressing influence; but is it not strange that they depressed sulphate far more than they did nitrate itself? This alone ought to show that nitrate has been used as a strong influence against sulphate values; and while, therefore, seriously affecting the latter, it still cannot be accepted as a permanent cause of a low range in sulphate prices. We shall not always have seasons favorable to its use, nor will it always do to have the plant prematurely, or even too early developed; which is, no doubt, the effect of nitrate of soda. Let a few wet seasons supervene, and we shall see what will be the result. Like gas and electric lights are sulphate and nitrate; a place is allotted to each, and one will never drive the other from its pedestal. And is it not strange that Germany alone should be the herald of this new departure? for we have shown that actually more sulphate is being used at home and in France.

If, then, it is clear that nitrate has been the principal instrument in causing the downfall of sulphate, the position appears to us somewhat anomalous—nay, too artificial to be taken as a future standard.

We feel impelled—if not in duty bound—to say a word more in reference to the circumstances we pointed to in our issue for 1882. We showed that the production of sulphate was likely to be largely increased; but we have already explained that the decline of prices has not resulted from this source. If it had, there would not have been reasonably sufficient justification for complaints about receding values. But, as already alluded to, the increase of production from various sources has not taken place in anything like the proportion which would be required to alone affect the market unfavorably; and we will now enter more into details.

We mentioned that the largest portion in the increase in the production of sulphate might be expected from coke ovens and other carbonizing plant; and how much this matter has been uppermost in the minds of chemists and scientific men is best shown by the number of patents taken out during the past twelve months. Their name is legion. There have been also immense discussions on the same subject, and many papers have been read; but, practically, the progress made and the actual results achieved are infinitely out of proportion to what has been stated and has appeared in print.

The fact is, when the recovery of the volatile products in coking, etc., processes first came to be considered, the most important of the products—ammonia—was, in its marketable shape (sulphate of ammonia) of a far different value to what it is to-day. Then those who intended to apply the process to their existing plant, or those who intended to erect special works, put down the value of sulphate, in making their calculations, at £20 to £21 per ton. To-day's value shows a difference of about 33 per cent.; and it can therefore easily be seen that, with the very expensive plant required, the labor and other cost, besides other great risks, it will hardly pay to work these processes now, except under specially favored conditions.

The small increase in the production of sulphate from this source in point of fact indicates that this mode, made so much of previously, has not been energetically pushed forward. There is no doubt, too, that a general application of coking—*i. e.*, coking all the coals used in the various factories—is more or less out of the question, simply because all coal is not fit for coking; and, while suitable coal will give good results, other coal will not do at all. At any rate, the cost of plant and working these ovens will have to be considerably reduced, to show the balance on the right side, while sulphate remains at its present low level. That the process has its advantages in many ways there is no doubt. Taking alkali works, for instance, they would have the ammonia (from the resulting liquor) to work the ammonia-soda process, and could also utilize the carbonic acid, assuming it could be obtained in a sufficiently pure state.

The largest extension of coking ovens has taken place in the North of England, where both the Simon-Carvès and Jameson systems are being used. The preference seems to be given here to one, there to another; and if the Simon-Carvès is said to be the better, Jameson's process certainly has cheapness to recommend it. The latter can be applied to the existing beehive ovens at a cost of about £20, making the total cost of the oven £80; while the Simon-Carvès ovens cost £180. Assuming, then, the coke turned out by both to be equally good, the yield differs. From the Simon-Carvès oven it is 77 per cent., and by the beehive oven only 60 per cent.; the former having also the advantage that in it inferior kinds of coal can be treated. The yield of bye-products per ton of coal in the Simon-Carvès system is about 27 gallons of liquor and 6 gallons of tar, against 6 to 9 gallons of liquor and 4 to 10 gallons of tar in the Jameson process. The tar in the latter case is said to be much inferior—nothing like gas tar; which, however, is different in the French oven.

As regards the ammonia collected from Scotch blast furnaces, the progress made has been much below the previous estimate, and the difficulties in connection with the process can be better realized when it is stated that the volume of gases from these furnaces is about thirteen times greater than that from the ordinary coal retorts. It is, say, about 130,000 cubic feet, against 10,000 cubic feet.

The anticipated increased recovery of ammonia by the patents of Mr. Young and Mr. Beilby seems, so far, not to have affected the market; nor can it be readily estimated, at the present stage, what the result will eventually be. Both gentlemen have been well to the fore with valuable papers on the increased production of ammonia, both in oil and in gas works—papers which bristle with valuable information as regards economical methods for the fractional distillation of coal for the recovery of the bye-products. Dr. Grouven, of Leipsic, seems to have been working for similar results; but as in all these processes the plant is very costly, and as the increased ammonia can only be produced at the expense of the benzole in the tar, it is, to our minds, by no means certain that a general adoption of these patents will take place. The present values of ammonia would, we think, militate against their extension. And to apply the methods to gas works, they would, we fear, have to be remodeled.

Of new patents, the one of Mr. Cooper—consisting principally in adding slaked lime to the coal before distillation for gas making—is worth mentioning. Its claims are (besides several other advantages) increased illuminating power, a purer gas, a good coke, and an increased yield of ammonia and ammoniacal products. This patent seems to have attracted a good deal of attention; and from the criticisms, partly favorable and partly unfavorable, from discussions and investigations published, it is evident that its merits will be thoroughly tested before it comes into practical use. Suffice it to say that one experiment on 50 tons of coal gave the following result—

Coal unlimed.....Liquor, 30 gals., 7.6 oz. = 228 gals., 1 oz.
Coal with 3 p. ct. of lime added.. " 35 " 8.7 " = 304 " 1 "

An experiment made here on a similar quantity showed a gain of 5 gallons of 8-oz. liquor per ton of coal carbonized.

In saying a word about the gas industry itself (to which we believe we shall always have to look for the principal source of ammonia), it is satisfactory to know that progress has been made in every department; and that, notwithstanding an increased consumption, we have to-day a purer gas, a better light, and cheaper prices than ever before. Surely we need not yearn for the electric light. As regards the increased consumption of gas (which, by the way, ranges from 4 to 9 per cent.), it has arisen in many ways. To begin with, in spite of higher candle power, in spite of improved burners (yielding now, in some cases, conditions of pressure and combustion being perfect, 6½ to 8 candles per cubic foot of gas consumed, against 1 to 1½ candles ten years ago), there is still the cry for "more light;" and, gas being so much cheaper, consumers can have their craving satisfied. Then there is the rapid increase in the use of gas heating and cooking stoves. Of the latter, some 20,000 are already in use in London (thus quickly increasing the coveted day consumption); there are also used some 6,000 to 7,000 heating stoves, besides close

upon 1,000 gas engines at work. Similar instances have been cited in cities and towns over the country.

Seeing that gas has been generally reduced by from 2d. to 6d. per 1,000 cubic feet, this is as it ought to be; and a further increase of consumption will, no doubt, be stimulated thereby, especially if gas suppliers can see their way to give separate meters, and to charge a lower price for the gas consumed by stoves. To show, however, what these constant reductions really mean, we refer to the statement made at the last meeting of the Gas Light and Coke Company. It was then shown that 1d. per 1,000 cubic feet made a difference of £55,000 in the revenue of the company. A further statement then given is interesting, as showing the magnitude of gas undertakings of the present day. The Governor stated that their revenue at the present time was equal to twice the revenue of the Kingdom of Greece; larger than the revenue of Denmark; equal to those of Chili, Saxony, Roumania, Mexico, and Persia. This will not be wondered at so much when we point out that this same company produced 15,000 million cubic feet of gas during 1882; and their largest day's consumption was more than 95 million cubic feet. This, however, seems only in keeping with the rapid and enormous extension of London; for we notice in the last annual report of the Commissioner of Police that, in twelve months, 23,321 new houses were built in the Metropolis, forming 508 new streets, 1 new square, and covering a distance of more than 75 miles.

Before leaving this subject, may we be permitted to mention a matter which, while not quite within the scope of our report, still has a large indirect bearing upon the future of the gas industry, especially while its enemies are on the *qui vive*. We mean to say a word about gas from a hygienic point, especially as its salubriousness as a domestic illuminant has been constantly denounced. We will first quote from a lecture given by Captain Douglas Galton, C.B., at the Parkes Museum of Hygiene, in London, on "Recent Improvements in Artificial Lighting, and their Bearing on the Purity of Air in Rooms." He said, in reference to the heat complained of in rooms lighted by gas, that "if persons would be satisfied with the same dim light to which they are accustomed when burning candles, or if they would increase the number of the latter so as to equal the light of the gas flame, the heat given out would be found to be less when burning gas than when burning lamps or candles." We gave some figures last year, showing that gas was by a long way the cheapest illuminant; we have here also the fact that it is the safest in regard to health.

We will also refer to a very interesting article on this question by Mr. Norton H. Humphrys, which appeared in the *Journal of Gas Lighting* in the early part of the past year. Mr. Humphrys says, in respect to the "sulphur compounds," which he considers harmless in the infinitesimal quantity in which they are produced in the combustion of coal gas, that people need not trouble themselves about it, as long as they tolerate the quantity of sulphur carried into our atmosphere by the combustion of coal.

Gas as a ventilating agent was an object of interest at the International Electric and Gas Exhibition held at the Crystal Palace.

Of the opponents to gas there is little to be said in our present report. To water gas, as used in America, and in connection with which rather too many fatalities have been reported, it will scarcely be worth while to devote any space. Sutherland's water gas has made some stir in this country, and he professes to have made 55,000 cubic feet of gas per ton of Staffordshire coal by his process. Its heating power—for which it would, no doubt, be principally employed—is, however, only half that of coal gas. On the other hand, it is stated that it may be produced at a cost of not exceeding 3d. per 1,000 cubic feet. Dixon's gas, as was feared from the first, seems to have been a failure. We thus narrow the field of opposition to that of electric lighting. But what has come after the grand parade and flourish of trumpets of a year ago? There has been a general *fiasco* of smaller or larger dimensions—shares have fallen, numerous companies have gone into liquidation, others are winding up, millions of money of ignorant people who rushed into the enterprise have been wasted, and all for no purpose whatever; for all the money spent has not even assisted the progress of this much talked of illuminant, which was to carry all before it.

Before concluding this "Review" we will ask and answer a question which is of vital importance to all connected with the trade. It is this: "Is recovery impossible?" Well, we unreservedly say, "No." This drop in prices is by no means unique; and if it is a general impression that prices will remain at a low level, there is all the more reason for looking for better times. Let us even take the view of a consumer and speculator, that sulphate must not cost more per unit of nitrogen than nitrate of soda, if it is to be as largely used as before. Does it follow that nitrate will keep at its present also unusually low value? And does it not stand to reason that it would be absurd always to regulate one commodity by the price of another, when it is borne in mind that the total production in the United Kingdom during twelve months of the one (sulphate) does not reach the quantity of the shipments of the other (nitrate) in one month alone? It must also be admitted that nitrate cannot be used for many of the purposes for which sulphate is absolutely required. The deliquescent nature of nitrate will not permit its use in the preparation of ammoniacal fertilizers; it cannot be employed to raise the standard of ammonia in Peruvian guanos; it will not do as admixture for guanos, etc., sent to the Colonies; it does not answer in conjunction with superphosphates in wet seasons (blight and mildew following its use); and it is practically thrown away when heavy rains follow its application—it is washed into the subsoil, where the roots cannot reach it.

We consider it a great mistake to take the events of the past twelve months as a base on which to build the future. We have shown the possibilities of the market. It is by no means certain that Germany will not return as quckly to an old friend, as the latter has been deserted by her; and the coming spring will show whether she does not, after all, require as much as before, having, through the peculiarity of the position, delayed her purchases. Further, seeing the low percentage of the ammoniacal guanos recently imported, and the reported cessation of shipments, will not these circumstances produce an increased demand for sulphate, as the most readily available source of ammonia?

We need hardly explain how utterly impossible it is to give a forecast; and therefore we will not attempt it. It will readily be admitted that the position cannot be made worse this year than it was during the past twelve months; and let us hope, for those interested in the manufacture, that it will be improved. The price in reality does not affect consumers in the same degree; and they will not, therefore, consider this latter desirable circumstance as partial. They will admit that an extinction of the trade would be as severely felt by them as by the producers.

We will now give a few figures to show the movement of the market and the course of prices. In the first instance we will approximately show how the production has been disposed of—a production which we have to estimate somewhat above former figures; and we will roughly take it as 75,000 tons. The channels for the outlet of this production were—

	Tons.
Germany, Denmark, and Sweden, etc.	28,000
France, Spain, and Italy	12,000
Belgium and Holland	8,000
Colonies, etc. (including sulphate of ammonia mixed in ammoniacal guano)	6,000
Home consumption (including liquid ammonia and ammoniacal liquor, used for chemical purposes; not including, however, the quantity absorbed by carbonate and muriate of ammonia makers)	17,000
Stock in first and second hands	4,000
Total	75,000

As an illustration of the loss to-day accruing to manufacturers in consequence of the low prices, the difference in the value of the above total quantity produced is about half a million sterling.

The following figures show the average prices obtained per ton of good grey (24 per cent.) sulphate of ammonia, f.o.b., Hull, England, for the respective years as noted:

Year.	Price. £	s.	d.	Year.	Price. £	s.	d.
1874	17	2	6	1879	18	8	9
1875	18	10	0	1880	19	0	0
1876	18	12	6	1881	20	4	6
1877	19	16	3	1882	20	8	6
1878	20	5	0	1883	16	11	0

The highest price reached for the year was that recorded for the opening month, the average figure for January being £18 15s. 0d.; the lowest monthly average price is that for December, which average shows the figures of £13 13s. 0d.

The Edinburgh Gas Works Chimney.

At a meeting of the Civil and Mechanical Engineers' Society (England) a paper prepared by Messrs. B. M. Bancroft and F. J. Bancroft, on the subject of "Chimney Construction," was presented and read. Among the examples cited by the authors was the following description of the retort house chimney of the Edinburgh (Scotland) Gas Works:

This chimney was designed by Mr. Mark Taylor, engineer to the company; Messrs. George Buchanan, C.E., and Prof. Gordon, of Glasgow, were consulted. The pedestal is square and of stone, surmounted by a circular brick shaft. Its dimensions are:

Stone foundations under ground	6½ ft.
Part of base	6
Stone pedestal above	65
Brick shaft	264 ft.
Total height from foundation to top	341½ ft.
Height from ground-line to top	329 ft.

The foundation stone is 40 ft. 6 in. square by 6 ft. 6 in. deep. The pressure on the bottom of foundation per square foot is nearly 2½ tons. The stone pedestal is 30 ft. square at ground line and 27 ft. 9 in. square at top. The internal diameter of the pedestal is 22 ft. 6 in. at bottom and 20 ft. 4 in. at top. This was built during one summer, at the end of which the works were suspended until the following year. The brick-work of the shaft was commenced and finished in the summer following the erection of the pedestal. The following dimensions relate to the outer brick shaft (circular):

Outside diameter at bottom		26 ft. 3 in.
Internal	" "	20 ft. 5 in.
Outside	" at top	15 ft.
Internal	" "	12 ft.

This was built up in five steps as follows:

1st section	35 ft.	high,	3½ b.
2d "	40 ft.	"	3 "
3d "	48 ft.	"	2½ "
4th "	58 ft.	"	2 "
5th "	83 ft.	"	1½ "
	264 ft.	total.	

The greatest pressure on any part of the work comes at the lowest section, where it amounts to about 8 tons 2 cwt. per square foot. The inner brick-shaft (circular) is distinct from the outer shaft, and is 90 ft. high, with 13 ft. internal diameter throughout, and was built in four steps, viz.:

1st section	14 ft.	high,	35 in. thick.
2d "	6 ft.	"	30 in. "
3d "	30 ft.	"	25 in. "
4th "	40 ft.	"	20 in. "
	90 total.		

The thicknesses include a lining of fire brick 10 in. thick for 20 ft. and 5 in. thick for the remaining 70 ft. The weight of the materials used is about 3,700 tons. The total cost was 4,637*l*. The lightning conductor is a solid copper rod ⅛ in. diameter. The stones used in the foundation are Cragleith, Humbie, and Hailes, which before use were tested by Mr. Buchanan and Mr. James Gowan. The tests were made in the most careful way by crushing-cubes of 1 in. square. The following were the results of tests:

Cragleigth	crushed at	315	tons per square foot.
Humbie	"	240	"
Hailes	"	225	"

A second test of Cragleith showed that before being crushed to powder it sustained a pressure of 440 tons per square foot. The appearance after fracture of the different cubes was that of a pyramid or wedge, and this led Mr. Gowan to assert that if the cubes were enlarged a greater relative increase of strength would be gained, and further that if the pressure were *vertical* to the line of cleavage a greater resistance would be obtained, so that such a stone as Hailes, which is a laminated stone, would increase in strength according to its surface more in proportion than that of a rock-stone such as Cragleith. This led to discussion and further tests, the result being that with a 4 in. cube from Hailes quarry the resistance was equal to 567 tons per square foot.

The Petroleum Deposits of Baku.

Mr. Charles Marvin, London, England, has published a very interesting account of the petroleum wells or springs in the vicinity of Baku, a seaport town of European Russia. Mr. Marvin tells us that no other petroleum source in the world can be traced so far back as that of Baku.

It boasts of a historical lineage compared with which that of every other supply sinks into utter insignificance. For more than 2,000 years Baku has been famous for its marvelous springs of petroleum, and we have historical evidence that for nearly 1,000 years its oil resources have been drawn upon for the benefit of surrounding nations. It is noteworthy that at every epoch its petroleum supply has been spoken of as enormous and inexhaustible, and that there has never occurred in the region any phenomenon calculated to provoke or sustain the belief that the supply is intermittent, limited, or likely to rapidly come to an end.

Various reasons contributed in ancient times to draw the attention of the Eastern world to the marvelous deposits of petroleum in the Apsheron peninsula, of which Baku is the principal center. Baku, in the first place, boasts of the best harbor in the Caspian Sea. Practically speaking, it is almost the only good harbor in the Caspian Sea, and not only contains accommodation in its lovely crescent-shaped bay for an entire navy, but also, thanks to an island like the Plymouth breakwater lying across the mouth of the bay, serves as a harbor of refuge during the violent storms which at times rage in that inland sea. Its position, further, as a port of call of the ancient stream of commerce flowing from the East up the Caspian to the Volga, added to its being situated close to the great highway of migration and invasion traversing the Caucasus towards Europe or Asia by the famous gates of Derbend, naturally made it known in the earliest times to the civilized world. It is too often forgotten in these Suez Canal days of ours that there was a period when for ages the trade of India and the East penetrated to Europe by way of Central Asia, the Caspian, and the Black Sea. Whether this trade circulated *via* the Caspian, the Volga, and the Don, or straight across Transcaucasia, *via* the river Kura (70 miles south of Baku) and the river Rion (at the mouth of which is Poti), Baku cannot but have rendered invaluable services as a transit port. It is worthy of notice that the Transcaucasian trade route mentioned by Pliny has been revived by the construction of the Baku-Batoum Railway, and that Baku, owing to its magnificent harbor and enormous resources of fuel, has before it a commercial future which must accelerate the development of its petroleum supply, and, owing to its being situated on the most important point of a great highway of commerce, give that supply increased value as years roll on.

Such were the advantages of position which naturally attracted the ancients to Baku. But, apart from Baku, the peninsula of Apsheron was calculated to thrust itself upon the notice of the world by a phenomenon which excites wonder even to-day. The peninsula juts far into the Caspian. At its extremity, and on the islands which stretch beyond it, the petroleum gas has flared for countless ages, arresting the attention of navigators at sea, as well as of people traveling by caravan on land, by its lurid glare at night. Such a phenomenon could not but excite the wonder of the superstitious East, and it is probable that the "Eternal Fire" on the peninsula was an object of devotion by the natives, even before the worship of fire became the religion of the Persians. According to Jonas Hanway, the fire worshippers from India, who flocked in his day to Baku, had a tradition that the Eternal Fire had flamed ever since the Flood, and that it would last to the end of the world.

Speaking on the subject of its antiqnity, Mr. Arthur Arnold, M. P. for Salford, who visited Baku in 1875, says: "Twelve versts from Baku we came upon one of the oldest altars in the world, erect and flaming with its natural burnt offering to this day. Surakhani is the ancient seat of probably one of the most ancient forms of worship. For unnumbered ages the gas which is generated by the subterranean store of oil has escaped from the fissures in the limestone crag, and the fire of this gas has lighted the prayers of generations of priests, as it blazed and flared away to the heavens. Fire worship in Persia, of which, until the eighteenth century, Baku formed a part, is older than history. It may be that the fire in this temple of Surakhani has been unextinguished for a period extending from before the time of Cyrus (B.C. 400), the fire-worshipping period being older than Cyrus."

In 1801 Baku was re-annexed to Russia. J. M. Kinneir, who shortly afterwards accompanied Sir John Malcolm's mission to Persia in the capacity of political assistant, gives us the next description of Baku in a famous geographical memoir published in 1813: The quantity of naphtha produced in the plain to the southeast of the city is enormous. The oil is drawn from wells, some of which have been found by a computation of the inhabitants to yield from 1,000 to 1,500 barrels a day. These wells are, to a certain degree, inexhaustible, as they are no sooner emptied than they again begin to fill, and the naphtha continues gradually to increase until it has attained its former level. It is used by the natives as a substitute for lamp-oil, and when ignited emits a clear light, with much smoke and a disagreeable smell. . . . The whole country around Baku has at times the appearance of being enveloped in flames. It often seems as if the fire rolled down from the mountains in large masses with incredible velocity; and during the clear moonshine nights of November and December a bright blue light is observed at times to cover the whole western range. This fire does not consume, and if a person finds himself in the middle of it no warmth is felt.

From 1813 to 1832 the extraction of petroleum was checked by its being rendered a State monopoly farmed out to a merchant named Meerzoeff. During the period from 1832 to 1850 the average production was 1,000,000 gallons of crude petroleum a year. Shortly before the Crimean war Dr. F. Wagner and F. Bodenstedt visited the Caucasus, and published a work in which they thus referred to Baku:

In the neighborhood of Baku large quantities of naphtha are found. It is burnt instead of candles, but the smell is very unpleasant. The whitish-yellow flame worshipped by the Indians exudes from the ground, and appears to be alimented by hydrogen gas. In M'Culloch's works, and indeed all others of the period, stress is laid upon the extensive character of Baku petroleum deposits, and the importance of the trade.

From 1850 to 1860 the average production was about 2,000,000 gallons a year. In October, 1860, Baku was visited by Mr. Osmaston, an English tourist. As he approached Baku at night he saw from the steamer "a bright light reflected behind the town, proceeding from the naphtha fires about seven versts off in the mountains." This was the same phenomenon which, centuries earlier, had awed the navigators of the Caspian Sea. "The soil all

round for two or three miles exudes this gas, for if the earth be loosened, or a small hole made, gas immediately bubbles up, which can easily be ignited."

In 1866 Baku was visited by Mr. Augustus Mounsey, Second Secretary to Her Majesty's Embassy at Vienna, on his way home from Persia. "The whole country, for several miles around Baku," he writes, "would seem to be underlaid by reservoirs of petroleum. Close to the Indian temple there is a large manufactory for the purification of it. The naphtha spurts like gas from a gas pipe, and burns in like fashion wherever a hole is driven 2 or 3 fms. into the soil."

In his book on Russian Metallurgical Works, published in 1870, by Herbert Barry, for many years engineer in Russia, he says (page 70): "Petroleum exists in great quantities on the borders of the Caspian near Baku. Its quality is considered equal, or even superior, to the American oil." A peculiarity of the Baku petroleum is its high specific gravity, as compared with American, having the same boiling point. It gives 10 per cent. more light than American, and is more readily drawn up the wick to the flame. The high specific gravity is availed of by manufacturers of lubricating oil, who send into European markets an oil of 0.940 specific gravity without any extraneous addition.

Two more opinions may be cited to clench the case. "The potential productiveness of the Baku oil region is incomparably superior to that of Pennsylvania," said Professor Mendelaieff, the celebrated Russian scientist, after a visit to Baku in 1882. "Comparing the results achieved in the two countries on one side, and the average depth and total number of wells on the other, it may be justly stated that the natural petroleum wells of Baku, as far as our knowledge goes, have no parallel in the world." Such was the opinion expressed by the British Vice-Consul at Batoum, Mr. Peacock, in a consular trade report published the same year.

Asphyxia from Illuminating Gas.

In dealing with this subject the *Scientific American* calls attention to the fact that scarcely a week passes when we do not read of cases of death from gas poisoning, some of them the result of carelessness in turning out the gas, others from ignorance in blowing out the gas, and a few intentional cases of presumed suicide. In addition to these accidents in sleeping rooms, which affect only the individual or individuals occupying the room, there are the dangers of poisoning from the gentle but continuous escape of gas from leaks and the larger escape from broken pipes.

Dr. Von Pettenkofer, who gives special attention to all questions of hygienic aspect, recently delivered a lecture in Berlin, in the course of which he treated the gas poisoning question as follows:

All kinds of illuminating gases injure the air in the same manner as it is contaminated by respiration of persons; namely, by depriving it of its oxygen and loading it with carbonic acid, water, and heat. Gas does not contaminate the air any more than stearine candles do, if we remember their relative illuminating power and let one gas flame equal twelve such candles. Hence, a gas flame is to be considered in a hygienical aspect as a step in advance, and no particularly injurious properties are to be assigned to it, since it injures the air only the same way as men do when crowded together in close rooms.

With unburned gas it is quite another matter, since the latter is a violent poison both for man and beast. It claims hundreds of victims annually, and whole families have been destroyed by escaping gas in houses where there were no gas pipes at all. Where there are pipes the gas makes its presence known by its odor, and the gas meter is a very safe indicator whether any gas escapes in the day-time, while the cocks are closed.

Far more dangerous and insidious are the escapes of gas from breaks in the street mains, whereby the gas is enabled to enter the cellars and lower floors of houses.

Why is illuminating gas so poisonous? he asks, and proceeds to answer it thus: because it contains carbonic oxide. The invaluable results of Grube's very thorough investigations are before us, and from these it appears that the injury done by this gas does not depend upon the continuance of its action, but upon its concentration, or the percentage of it in the air. Air containing five parts in ten thousand can be breathed by men and animals for hours and even days without any injury to the health. From seven to eight parts in ten thousand cause indisposition; twenty parts produce difficult breathing, loss of power, and uncertainty of motion; with twenty to forty parts drowsiness begins, and when there is still more carbonic oxide in the air the poisoning is attended with violent symptoms. Brain and spinal column especially are affected; cramps seize the victim, yet he may recover if brought quickly into fresh air. Breathing air heavily charged with carbonic oxide for a long time may likewise cause death.

In the cases of poisoning above mentioned, observation showed that the quantity of carbonic oxide in the air of the room varied at different times, though the source of the poison (the broken pipe remained the same.

Medical statistics gave the following very surprising result—that accidents resulting from the escape of illuminating gas from broken pipes were almost exclusively confined to the colder seasons of the year. Out of twenty-two cases reported last year in Munich, five were in October, two in November, two in December, three in January, eight in February, and two in April. The months of May, June, July, August, and September were free from such occurrences. Hitherto this peculiar circumstance has been explained in a general way as follows: Since breaks are known to be more frequent in winter than in summer, it may be assumed that the frozen earth prevents the gas from escaping through the roadway; hence it is sucked into the neighboring houses and there does its mischief. The results of scientific investigation do not altogether substantiate this theory. It is true that frozen ground is harder than the unfrozen, but it is by no means air tight, and allows gas to pass through as well as when it is not frozen. What is far more important is this—that houses heated by the most improved methods and kept warm within act like cupping glasses on the ground air, by sucking it in and the gas with it.

The lecturer proved most conclusively, by presenting the results of experiments and observations of all sorts, that there is, in fact, more gas in the earth in summer than in winter, when the draught toward heated houses is very striking; thus the inflow of gas increases with the difference between the temperature of the heated room and the external air, while on the other hand there is a decrease as soon as the windows are kept partially open.

Since gas that has passed through the earth is odorless, so that the smell is not perceptible until the soil becomes saturated with the gas, its entry into inhabited houses is the more insidious and dangerous, because it does not appeal to the sense of smell. For this reason special precautions should be taken in regard to cellars and ground floors, and when those living there suffer notably from headaches, it is advisable to open the windows. If the same occurs again after ventilating for hours, we may assume that there is an escape of gas somewhere in the neighborhood.

When a broken pipe is found, it is not sufficient to merely repair the break; but it was most urgently insisted on by the lecturer that the police should compel the inhabitants of all the neighboring houses to keep all their windows open for a long time. It is only in this way that serious accidents can certainly be prevented, for the gas that remains in the soil will continue to flow into the houses, after the break has been repaired, as soon as the aspirating process begins with the setting in of cold weather.

Turning to the importance of hygienic investigations, Pettenkofer pleaded most energetically for the establishment of hygienic institutes in all universities, such as have hitherto been confined to Munich and Leipsic, although Gottingen is now beginning the erection of such a one.

It is well known here that our streets are rarely ever torn up for any purpose whatever without the smell of gas being very apparent to the least experienced, and gas men know only too well that there is a continual waste through small leaks that cannot be easily found where pipes are buried beneath the ground. In some towns this leakage is so great that the gas is turned off during the day. Hence we see how gas may and probably does enter every heated house having an open cellar.

Examination of Ammonia Water.

Mr. S. Dyson recommends the following procedure—

Sulphuretted hydrogen and carbon dioxide are recognized by the effervescence produced when acidifying the gas water. They are always present. To detect chlorides, the sulphides, carbonates, ferrocyanides and sulpho-carbonate are precipitated with zinc sulphates filtered, and the filtrate precipitated with copper sulphate. The filtrate from the last precipitate is acidified with nitric acid, and tested with silver nitrate.

Thiosulphates are recognized by precipitating the solution with zinc sulphate, adding barium chloride to the filtrate, filtering and adding hydrochloric acid to the filtrate. In the presence of hyposulphites, the solution when heated gives off SO_2 and precipitates sulphur.

To test for sulphites, the solution is treated as in treating for thiosulphates. The barium precipitate is treated with hydrochloric acid, the barium sulphate is filtered off, the filtrate is treated with chlorine water, and then precipitated with barium chloride.

Sulphocyanides are detected by adding ferric chloride to the filtrate from the zinc sulphate precipitate.

Sulphates are detected by boiling the liquor with hydrochloric acid, adding some zinc oxide to clarify the solution and precipitating any ferrocyanide present, filtering and adding barium chloride.

Testing for ferrocyanides. The gas water is evaporated to dryness, taken up with water and filtered. To the filtrate is added a solution of ferrous sulpate, to which a small quantity of stannous chloride has been added. A light blue precipitate indicates ferrocyanide.

Testing for cyanides. The liquor is acidified with sulphuric acid, and zinc

sulphate added. It is filtered cold and the filtrate is distilled. The distillate is then tested for prussic acid.

Acetates are detected by evaporating to dryness, treating the residue with water, mixing the filtrate with a solution of silver sulphate, and distilling the filtered and washed precipitate with sulphuric acid.

Sulphocarbonates, which probably occur only in fresh gas waters, are detected by precipitating with zinc sulphate and distilling the washed precipitate with water. The sulphocarbonate is then split up into zinc sulphide and carbon bisulphide, which latter is detected in the distillate by its odor, or with triethylphosphine.

The St. Louis (Mo.) Gas Controversy.

Judge Lubke, on Tuesday, Jan. 15, rendered the following opinion in regard to the case of the St. Louis Gas Light Company *vs.* St. Louis Gas, Fuel and Power Company :

"This cause was fully heard and tried upon its merits, and a finding and decree entered for plaintiff on November 13, last, restraining defendant from laying pipe and vending or in any manner distributing illuminating gas in that part of the city lying south of the south line of Washington avenue until the expiration of plaintiff's charter, on January 1, 1890. Within four days thereafter defendant filed a formal motion for a new trial and rehearing, assigning the usual grounds. This motion was not called up until the 2d of January, inst., and was then submitted without argument. In all cases where there has been a trial, motions of this character must be made before an application for an appeal can be heard, the purpose of the motion for a rehearing and a new trial being to give the trial court an opportunity to correct its errors, if it is persuaded that error has occurred or injustice has been done. When this cause was decided on November 13, I filed a full statement of my findings upon the evidence, and my conclusions upon the law of the case, and the reasons which led to these conclusions, with a review of the decisions cited by the counsel. The reflection upon the case which I have since given it has only served to confirm my belief in the correctness of the views then expressed. The motion for a new trial will therefore be overruled.

"Upon the submission of the motion for a new trial, defendant the 2d inst. filed a motion or petition praying the court to modify the final decree of injunction by striking therefrom the part which restrains defendant from laying pipe within the district named. This motion or petition concedes that, under its charter, the plaintiff has the exclusive right until January 1, 1890, to vend gas within the territory named ; it insists, however, that the injunction order is too broad, in that it prohibits defendant from laying pipe for heat and power purposes, and also prevents it from laying pipe within the district named before January 1, 1890, to be used by it after that date for vending illuminating gas within said district under an ordinance now pending before the municipal assembly, and which defendant with confidence expects will be passed. The injunction order restrains defendants in general terms from laying pipe within the district named before January 1, 1890. It is therefore broad enough to include or cover these two claims made by this motion or petition of defendant. When this action was begun, and the preliminary injunction granted, defendant had no charter authority to engage in the manufacture of illuminating gas. It got this authority only by amending its charter before its answer in this case was due. Now as to its claim that it ought not to be prevented from laying pipe for heat and power purposes, that was fully considered at the trial, evidence was adduced upon the proposition, and the court found that defendant when it ceased experimenting and began business in earnest, abandoned all purpose to lay pipe for furnishing heat and power only, the business authorized by its original charter having been a failure. The petition now filed does not show any change of purpose in this respect, and there is nothing in it upon this proposition which would authorize any amendment of the injunction order. As to the claim that defendant ought to have permission to lay gas pipes at once within the plaintiff's territory provided the ordinance referred to is passed, this finding already made in the decision of this case has shown that no action of the municipal assembly can authorize the invasion of this territory against plaintiff's consent while plaintiff's exclusive franchise of laying and maintaining gas-pipes and conductors and vending gas by means thereof continues in force.

"Comparing the final decree with the prayer of the petition in this case, it seems clear that instead of the decree being broader than the prayer, the reverse is the case. Plaintiff prayed that defendant be also enjoined from manufacturing gas for illuminating purposes within the territory south of Washington avenue upon the ground that this gas was to be sold to and used by persons living south of this line. The court overruled this prayer.

"The motion to modify the final decree of injuction will also be overruled. The same order is made upon the plaintiff's motion to strike from the files this motion of defendant to modify final injunction, the motion last named having been considered upon its merits and being now overruled."

Gas Making by Cooper's Lime Process.

Professor Wanklyn presented a paper, on "Gas Making by Cooper's Lime Process ; with Notes on a Method of Gas Analysis for Use in Gas Works," at the Session of the Manchester Section of the Society of Chemical Industry, held Tuesday, January 8.

Professor Wanklyn, in describing the process, stated that this particular method of gas making consisted in the substitution of a new gas-generating material—viz., limed coal—for coal in gas manufacture. The process had been worked on a very large scale at a London gas works ; 3,000 tons of limed coal having been carbonized weekly for a long period with the most satisfactory results. At a gas works at Tunbridge Wells the process was also worked. The advantages of the process were an improved coke, which burned without evolving fumes of sulphurous acid ; an increase in the yield of ammonia, and a gas of unprecedented purity. Both in London and at Tunbridge Wells the sulphur in the gas had been diminished to 3 or 4 grains per 100 cubic feet. In Manchester, as was well known, the sulphur was frequently 40 grains. There was also a great abatement in the nuisance occasioned by gas works where the process was employed ; and on sanitary grounds it ought to be generally adopted. In no place was there, he declared, greater need for the process than in Manchester.

In the subsequent discussion—

Mr. J. West (gas engineer to the Manchester Corporation) said the corporation were desirous to do the best they could in the interest of the public ; but they would need some definite proof that the advantages of the new method were as great as stated. It was a question with him whether the application of lime in the manner proposed by Mr. Cooper was the best possible thing. It must be remembered that what could be successfully accomplished in one part of England could not be done in another. The coal used in the southern districts was such as the lime could be thoroughly mixed with ; but the coal and cannel employed in Manchester would not admit of such thorough mixing. He was not certain whether there were not some drawbacks to Cooper's system. He did not doubt that the process would effect an increase of ammonia and a reduction of the sulphur compounds ; but the question arose as to what effect it would produce upon the coke. This was a very serious consideration. In the South, he was informed, the process had no detrimental effect upon the coke. But there they had only about 5 per cent. of ash, whereas in some of the materials used in Manchester there were 20 or 30 per cent. of ash, and any addition of lime would increase the difficulties of the furnaces. Some experiments with Cooper's process had been made in Manchester, and no doubt they would make still more ; and if the system should prove to be an advantageous one, he was sure all would be under great obligation to Mr. Cooper and Professor Wanklyn.

Mr. S. Hunter (gas engineer to the Salford Corporation) said the system referred to by Professor Wanklyn had been tried in Salford, but altogether satisfactory results were not obtained. They found an increase of ammonia, and a decrease in the charge for purification. The purifiers lasted longer, but there was no increase in the yield of gas. The fact that moisture had to be put into the retorts along with the dry coal seemed to be detrimental to the yield of gas ; and, as a matter fact, there was a decrease in the yield. If the adoption of the process led to an increase in the price of gas, consumers would immediately complain that the gas was too dear ; and any advantages in respect of the quality of the gas would be lost sight of. It was for consumers to make up their minds to the possibility of gas being made purer ; and as soon as they indicated that they were prepared to pay more in order to have pure gas, it would be given to them.

A Unique Gas War.

The Rev. Mr. McNulty, in charge of the Catholic church at Johnstown, N. Y., is at variance with the members composing the church choir, and the cause of the difference is to be charged to the "horrid gas bills." The choristers thought that gas would be the most sensible means of lighting the organ loft ; the pastor did not see it in that light, and strenuously opposed the installation of the "lying meter," on the ground that the employment of gas for lighting would be too expensive. However, gas was introduced, and the reverend gentleman determined to checkmate the move of the innovators by altering the time of the vesper service from seven o'clock in the evening to four o'clock in the afternoon. Then came the "tug for gas." On the afternoon of Sunday, January 20th, at the appointed time, Father McNulty performed the vesper service, but the organ loft failed to give out its accustomed strains, and the choristers were not in their usual places. Johnstown "saw another sight" a little later on. Promptly at seven o'clock in the evening the organist and members of the choir filed in and took their proper places, the innocent cause of the row was turned on, and very impartially shed its beams over organ loft, altar, and surroundings. A vesper service without a "clerical president" was then proceeded with. When the psalms, anthems and hymns were finished the musicians departed, the gas was shut off, and "peace once more reigned within." The "gas war" has divided the congregation into two factions, and much bitter feeling has been engendered. The chances are much more than even that gas, as usual, will come out ahead.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Will it be Done?—The Troy *Times* suggests that, if there is to be an investigation of matters pertaining to the new capitol building at Albany, N. Y., it might be as well to make special enquiry as to the expenditure of $97,000 involved in the electric lighting of the State's "white elephant."

A Zanesville (Ohio) Clerk Finds a Gas Leak.—Mr. Charles Johnson, book-keeper to the dry-goods firm of Johnson & Abbot, of Zanesville, Ohio, being rather behind-hand in posting his accounts, had occasion to remain in the counting-room after regular business hours. Detecting the smell of escaping gas, he made search after the source of the leak; when his unerring nostril had guided him to the seat of trouble, acting in the usual "orthodox" fashion, he "struck a match," and the consequent explosion "struck him." The noise brought assistance, and the flames resulting from the explosion were immediately extinguished. Mr. Johnson was not severely injured, but it is safe to assert that, should a similar chance to "find" a gas leak ever present itself to Mr. Johnson's notice, the match will be relegated to a less prominent position than it occupied in the recent "hunt."

Petroleum vs. Pitch or Resin Torches.—The conclusions arrived at, from a series of experiments made by engineers connected with the Prussian railway system, the object of same being to determine the relative merits and comparative efficiency of petroleum and pitch or resin torches in practical working, are that although petroleum torches afford a clearer flame than do those of the other class, they are more liable to derangement from certain atmospheric conditions, and do not appear to diffuse the light equably. While the petroleum torch may possibly be of greater convenience, owing to greater facility and ease in lighting and extinguishing, when doing ordinary track repairs, the experimenters decide that, in cases of accident, etc., the pitch or resin torches are of considerably greater worth. Hereafter the baggage cars and tenders on Prussian railways will carry a supply of pitch torches as part of the equipment.

The Truthful News Reports?—A despatch, dated Troy, N. Y., Jan. 21, which was published in all the leading daily papers of the United States, contained the following: "The village gas works at Malone, Franklin county, N. Y., exploded on Saturday (Jan. 19), demolishing the buildings and adjacent structures. A watchman and a boy were severely bruised. The village will be without gas until warm weather." The real facts in the case appear to have been thus: There was an explosion at the Malone gas works, which occurred in the purifier room, at 5.30 o'clock on the morning of Jan. 18. The retort benches and purifier room are situated in one long brick building, being separated from one another by a brick partition. The company's operations do not seem to have been conducted on a scale large enough to admit of the employment of an engineer, and the details of manufacture were overlooked by the Secretary and Treasurer, Mr. Hawkins, who had been confined to his bed for some days prior to the accident. When news of the accident was sent to Mr. Hawkins, he immediately telegraphed to Mr. J. H. Findlay, manager of the Ogdensburgh gas works, asking him to determine what the trouble was, and empowering him to institute measures for setting things to rights. Mr. F. promptly and generously responded to the call, and his examination proved that the pipe leading from the scrubber to the center seal was almost completely stopped up. The seals of the condenser, scrubber, boxes, etc., were all syphons, and no further imformation need be given here to make the cause of the explosion plain. The retort benches were not injured, neither was the gasholder, and on Thursday, Jan. 25, gas was once more supplied to the consumers. Mr. Findlay brought this result about by fishing one purifier out of the ruins, and connecting the same directly with the scrubber and station meter; he is now engaged in putting up another purifier, having improvised a plan of working without center seal. The work of rebuilding the fallen walls has been commenced, and no one was severely injured. The Malone people have drawn two morals from the affair, leaving out of the question any consideration attached to negligence on the part of the workman who was in charge at the time, and the experience gained may thus be itemized—First, no more syphon seals; second, locating the purifying room at a safe distance from the retort house, and in a separate building.

It is rather troublesome to reconcile the newspaper report with the facts as above given. Either a "warm wave" set in very early at Malone, or else New York city is drifting nearer to the North Pole.

Yonkers (N. Y.) Gas Light Company.—At a recent meeting of the board of directors of the Yonkers (N. Y.) Gas Light Company, a dividend of three per cent. was declared, which was made payable February 1. Superintendent James Slade was elected to fill the vacancy in the directorate caused by the resignation of Mr. James Bruce, the latter gentleman having sailed for Europe. Yonkers, with a population of 20,000, has four gas companies—viz., the Yonkers Company, the Municipal Company, the Strong Fuel Gas Company, and the Lowe (or Westchester) Company, the two latter concerns being, we are informed, in the hands of a receiver. The old company has made a stubborn resistance to all kinds of attacks during the past eight years, its motto evidently having been "thousands for defence, but not a cent for tribute." We are pleased to see that its dividends, though small, are regularly paid and honestly earned. It is also apparent that the directors are in thorough accord with the management of Superintendent Slade.

Naming the City's Representatives in the Louisville (Ky.) Gas Company's Board of Directors.—At a meeting of the Louisville (Ky.) Council, Jan. 10, Alderman J. G. Gilbert placed in nomination the names of John G. Baxter, James A. Leach, George Mulligan, and Jacob L. Semper as the persons to represent the city of Louisville in the board of directors of the Louisville Gas Light Company. When the names were read Ald. Kean moved that the nominations be closed, and Clerk McCleery proceeded to call the roll; the result being the unanimous election of the gentlemen proposed.

A New Gas Company.—A company, with the title of "Sarnia Consumers Gas Company," of Sarnia, Ontario, has just organized, and preparations to begin work as soon as the season will permit have been instituted. Mr. D. Douglas, managing director and secretary of the new company, writes us, under date of Sarnia, January 25: "The electric light is not likely to supersede gas at present. Mr. Edison's agent has been here twice, but can offer no inducement to make us change our opinion. We have investigated his claims, and two of our most practical business men have visited New York city, on two occasions, for purposes of examining the merits of the electric systems, the result each time having been that they considered gas as the best and most economical lighting agent."

More Calendar Visits.—We have received from Messrs. D. McDonald & Co., of Albany, New York, copies of their "Gas Engineer's and Superintendent's Pocket Annual," and calendar for 1884. The "Pocket Annual" is of convenient size and shape, and is neatly gotten up. Parson's improved tablets are used in the make up of the calendars, which are certain to be appreciated by those who have occasion to refer to them.

Election of Trustees, Philadelphia (Pa.) Gas Trust.—A rather bitter contest ensued in the select and common branches of the Philadelphia Councils over the appointment of four trustees to take the place of the members of the Gas Trust, whose terms of office had expired. The final result of the matter was the election of Messrs. William Leeds, John S. Rittenhouse, E. B. Morris and James E. Salter, on Thursday, January 17.

Gas Explosion at Boston, Mass.—A despatch, dated Boston, January 19, says that an explosion of gas occurred on the premises Nos. 157 and 159 Hanover street, January 18, by which the buildings were wrecked and the contents destroyed, the loss occasioned being estimated at about $15,000. Two persons were injured, neither dangerously. We have no further details concerning this affair, and bearing in mind the despatch from Malone, N. Y., given elsewhere, it is hard to say what amount of credibility should be attached to the "news" from Boston.

Ohio's Coal Product for 1883.—It is reported that the coal product from Ohio's mines, during the year just closed, reached a total of 8,230,000 tons.

Waterbury (Conn.) Rumors.—The Secretary of the Citizens Gas Light Company, of Waterbury, says they are making it rather lively for the Waterbury water gas concern. The consumers on the water gas company's mains are complaining about bad gas, bad light, bad smell, etc. The Citizens Company is gaining rapidly in number of consumers.

They Will Not be Allowed to Light Evansville, Ind.—In our issue of January 2d we announced that the "United Gas Improvement Company and the Southern Gas Works Company, per H. D. Fitch, Manager," had made application to the Evansville (Ind.) Common Council to be allowed the privilege of laying mains and operating a gas plant in that city. The prayer of the petitioners was referred to a special committee, and this committee, after a thorough investigation of the subject, reported to the council against the grant, giving their reasons for such adverse action in the shape of a voluminous report. The facts contained in the statements of the subcommittee were so convincing that when the report came before the council for rejection or adoption only one councilman was recorded as being in favor of the former alternative. The subject of granting the prayer of the petitioners was then balloted upon, and this was denied by a vote similar in result to the former—only one member being recorded in the affirmative. One of the local daily papers, whose editor is by no means any too liberal in his dealings with the Evansville Gas Light Company, made the following comments on the action of the council:

"The attention of the citizens of Evansville, and especially of the gas consumers, is called to the report of the council committee adverse to the ordinance giving the water gas company the right of way in our city. It is a lengthy document, because the committee, after having made a thorough and laborious investigation of the history of the gas business in other cities, which conclusively demonstrated the inadvisability of admitting another gas company into the city, felt it their duty to present to the council and the people the facts and reasons upon which they based their action. We feel confident that no fair-minded man can read that report, and weigh the facts it contains, without coming to the same conclusion as did the committee—that it is not to the interest of the people to allow another gas company to get a foothold here—that the nature of the gas business would not admit of continued competition in a city of this size, and would inevitably result in consolidation, an increase of capital upon which a dividend must be paid, and a consequent increase in the price of gas. Many other cities have tried the experiment, as is shown in the committee's report, and in no instance has competition brought lower prices. This fact may strike the reader as being inexplicably anomalous and directly contrary to what he may regard as a universal rule of trade—that competition does make lower prices. But if the nature of the business is taken into account, the amount of capital required to establish the plant, and the absolutely limited field from which it must draw its support, the mystery will vanish, and the truth of the proposition that no lasting public benefit can be got through a competing gas company will be readily recognized by every intelligent man, and the wisdom of the action of the council acknowledged by him. We have the experience of many cities before us, and we ought to be smart enough to profit by it. It all teaches the same lesson, and we can get it for the trouble of informing ourselves, while to buy our own experience would be an expensive and useless luxury. We do not mean to argue that the people are at the mercy of a great monopoly, and must submit to any imposition which the consolidated company might choose to inflict upon them. In supporting the old gas company and opposing the coming of the new, it has been far from our purpose to instil into the people the humiliating lesson of quiet submission to the insults and oppressions of soulless monopolies, or to foster imperiousness or arbitrariness in the consolidated company. Our course was prompted by the belief that the proposition to establish new gas works here was not made for legitimate purposes, and that in any event it was not to the interest of the public to give any new gas company a right of way at this time; and we feel proud that we have again done the city a benefit by lending our efforts toward bursting a big speculation which the people would have had to pay for had it been successful. We hold that, although the consolidated company has a monopoly on gas and electric light in this city, it is not independent of the people. So long as coal oil is so plenty and so cheap, no man is at the mercy of a gas company. Thousands of families burn coal oil to-day, and many of them have discarded gas for oil because they thought themselves badly treated by the old gas company. Coal oil is the great and dangerous competitor of gas companies, and we take it for granted that the new management will have the sagacity to realize that they must win new patronage from the burners of coal oil, and that they can only do this by liberal and fair treatment."

THE LOUISVILLE (KY.) GAS COMPANY NOT LIABLE FOR BACK TAXES.—Some time since, the city authorities of Louisville, Ky., brought suit against the Louisville Gas Light Company to recover a certain sum of money which the city claimed was due on account of back taxes for the years 1876 to 1880. The whole matter was referred to an arbitrator who reported that in his judgment the gas company was indebted to the city in the sum of $66,124, the referee holding that the street mains, lamps and meters belonging to the company could legally be subjected to taxation. When the final report of the arbitrator was filed, the company further resisted the payment of the sum above named on two grounds: First, that the property and effects of the company were exempted from taxation by section xvii. of its charter, and, secondly, that the levy ordinance of the years for which the suits for taxes were brought did not embrace the street mains, lamps, and meters of the company.

Judge Edwards, the magistrate who decided upon the merits of the demurrer, held that the gas company was not exempt from taxation for city purposes, but also held that the levy ordinances, on which the assessments are based, were insufficient, as the property described in the assessments was clearly personal property, and not real estate. In the levy ordinances of those years there was defined what constituted taxable personal property, and street mains, lamps and meters did not appear upon the schedule, and, as a consequence, these appurtenances, said Judge Edwards, could not be held liable to taxation owing to defective drawing of the schedule. Had the levy ordinances been properly drawn, so as to embrace the property of the gas company, the tax would have to be paid, but, under the circumstances, the demurrer would be sustained. The Honorable J. K. Goodloe appeared for the company, and through his efforts the Louisville gas company has been freed from the payment of what appears to us to have been an unjust claim.

THE MANKATO (MINN.) GAS WORKS.—This gas works was fired-up on September 18, 1883, starting in with 115 ordinary consumers, and 40 Bartlett "Boulevard" street lamps. Since the first day of working the company has steadily added to its operations, and the outlook for the future is decidedly encouraging. Messrs. O. C. McCurdy & Co. are so pleased with their venture, that they expect to build at some other point during the coming season.

THE JACKSON (MICH.) GAS LIGHT COMPANY.—The annual meeting of the shareholders of the Jackson Gas Light Company was held on January 15, every share of the capital stock being represented, even some of the shareholders of the gentler sex appearing in person. Quite a lengthy report was rendered by the retiring president, Mr. P. B. Loomis, who stated that he had held the presidency of the corporation for 27 years, in fact, ever since the company was organized. It may also be put on record, in this connection, that Mr. Loomis gave his services to the company for this long period without requiring any compensation for the same in the shape of a salary. The treasurer, Dr. Potter, presented his annual report concerning the business affairs of the company; the figures given showing a very flattering financial condition of things. When the reports had been disposed of, the stockholders proceeded to an election of directors, Mr. Loomis giving notice that he would not accept a re-election. The ballot resulted in the selection of Messrs, D. F. Dwight, Alonzo Bennett, N. S. Potter, W. R. Reynolds and F. D. Bennett. Immediately afterwards the new board of direction organized with the election of Mr. D. F. Dwight as president, and Mr. F. D. Bennett as secretary and treasurer.

TO PREVENT "BLOWING IT OUT."—A New York exchange says that a Philadelphia hotel-keeper seeks to scare the rural visitor into turning off the gas by posting the following notice in the sleeping rooms—

"The relatives and friends of guests who blow out the gas will have to pay for the amount of gas wasted before the body will be delivered."

GAS MATTERS AT DALLAS, TEXAS.—The Dallas Gas Light Company reports business very brisk; the increased send-out necessitated enlarging the plant, and extensions to street mains. There is a big field opening out to the gas industry in the Lone Star State.

ENGINEERS' CLUB OF PHILADELPHIA, PA.—At the Sixth Annual Meeting of the Engineers' Club, held at the Society's rooms, No. 1,523 Chestnut Street, Philadelphia, Pa., on January 12, the following-named gentlemen were elected to serve as officers for 1884: President, Col. William Ludlow; Vice-President, J. J. de Kinder; Secretary and Treasurer, Howard Murphy; Directors, T. M. Cleeman, Frederick Graff, Rudolph Hering, Washington Jones and Henry G. Morris.

MORE "LIVELY" ELECTRIC WIRES.—The necessity for doing away with overhead electric light wires was forcibly illustrated at the Baltimore and Potomac Railroad depot, Washington, D. C., some time ago. There are fourteen electric lights in the building. On the night in question, without the slightest warning, the whole of the lights blazed forth in an alarming manner, shooting out tongues of flame almost to the ceiling, the burners meanwhile throwing off sparks of incandescent carbon in every direction, seriously threatening the safety of the building and causing the passengers below to seek safety beyond the range of the fiery missiles. Fortunately, an employee of the electric light company was at hand, who quickly conveyed to headquarters the fact that some serious complication had arisen, and the current was speedily cut off, not, however, before the mechanism of all the burners was destroyed, and some completely burned up. One of the "carbon setters" of the electric light company attributed the trouble to the crossing of their wires with one or more of the wires of a telegraph company.

ELECTION OF DIRECTORS.—At the annual meeting of the New York Gas Light Company the old board of directors was re-elected. The following are the names: Messrs. James R. Taylor, John J. Astor, Frederic W. Stevens, Thomas K. Lees, Percy R. Pyne, William Remsen, Samuel Sloan, Edgar A. Auchincloss, Alexander H. Stevens.

The Metropolitan Gas Light Company, of New York city, also named the board which controlled its affairs during 1883. The names are those of Messrs. Oscar Zollikoffer, R. A. Arkenburgh, Thomas T. Buckley, Albert Cornell, John P. Huggins, D. H. McAlpin, Henry Meyer, A. D. Peck, John L. Riker, George F. Victor, Augustus Schell, O. F. Zollikoffer.

FAILURE OF A SMOKE-CONSUMING DEVICE.—The Buffalo (N. Y.) Brush Electric Light Company started out, not such a great while ago, with a

tremendous flourish of trumpets concerning what they were about to accomplish in the way of sanitary reform by the introduction of an apparatus which was to transform their boiler-house chimney into a vessel that would no longer be crowned with a smoke cloud. The apparatus was installed, but it did not work, and it will not work. The statement is made that the new smoke-consuming "boiler" is a pronounced failure. It was put in at the Wilkeson street station, at a cost said to be "several" times that of an ordinary boiler of equivalent size and capacity, but it cannot be made to answer the requirements. It does not consume the smoke; it will not burn soft coal as it should, and the sum and substance of the whole matter is the apparatus is an utter failure. What is to be done with the corpse is the question now agitating the minds of the "sanitary reformers," the latest rumor being that the company which set it up will make an attempt to "galvanize" the defunct patented "wonder." The Buffalo Brush Electric Company sorrowfully announces "that it has, at present, no well-defined ideas on the subject of smoke consumption."

Boston (Mass.) Street Lighting.—From the annual report of Mr. Hugh J. Toland, Superintendent of Lamps and Gas, Boston, Mass., we learn that there are now in use in that city 381 electric street lights, an increase of 165 over those employed in 1882. The total number of public lamps of all classes in Boston, December 31, 1883, was 12,623—a decrease of 344 during the past year.

The balance of the appropriation for the financial year 1882-83, on hand January 1883, was	$135,555.27
Expenditures to April 30, 1883, the close of financial year	139,995.76
Deficiency	$4,440.49

This deficiency was provided for by transfer from other appropriations made by the auditor of accounts.

The appropriation for the financial year ending April 30, 1884, was	$500,000.00
Expenditures to date of report	340,310.30
Balance on hand	$159,689.70

or an amount more than sufficient to meet all the anticipated ordinary expenses of the department until the close of the present fiscal year.

Gas Matters at Zanesville, Ohio.—Mr. Eugene Printz, Superintendent of the Zanesville Gas Light Company, writes us that his company, during the last twelve months, made two reductions in the selling price of gas, the first being made on April 1, 1883, when the price was lowered from $2 to $1.80 per thousand; the second concession was granted on January 1, 1884, the price having been then scheduled at $1.50 per thousand. In his letter Mr. P. states that the company was, in a measure, enabled to make the last reduction from having "increased the purifying capacity of the boxes, these having been enlarged from 8′ × 10′ square to 10′ × 20′ square, thereby reducing the labor and lime account in that department to a considerable extent. We have had also quite an increase in our consumption. We think our present price for gas very reasonable for a city of only 20,000 people, with the town, as it is, spread out over a large territory; yet there are some people in our city who think very differently, and claim we are charging much more than we ought to." Our advice to Mr. Printz is, never mind the "chronic grumbler," who, to all intents, and purposes, is never satisfied save when he is miserable. The new rate at Zanesville is a cheap one, and ought to satisfy every gas consumer in the place.

Fired by Arc Light Wires.—On the evening of January 24, pedestrians passing the *Evening Post* building, Broadway and Fulton street, New York city, noticed a bright flame darting out between the *Post* building and the structure adjoining, on the east side, the two houses being separated by a space—probably two inches in width. Investigation showed that the fire existed in a long strip of wood standing vertically between two of the wires of the United States Electric Illuminating Company. These wires lead from the street lines of the electrical company to the *Post* building, and from there around two insulators down between the adjacent buildings, terminating in the sub-cellar of the *Post* structure. The wires were sheathed in rubber tubing at the point where the flame was first noticed. News of the trouble was immediately sent to the Elm street station, and the current was at once turned off. One of the workmen connected with the electric company, when questioned as to the probable cause of the accident, replied: "I cannot tell just how it happened; I can only guess to-night that the heavy soaking rain did it." Better put them underground.

Going Underground, or Somewhere Else.—Since date of January 26, Freeport, Ills., has been denied the boon (?) of electric lighting. Mr. F. J. Collmann, the manager of the Vanderpole electric light system, in that town, shut off the current, and declared that he would move his machinery to some other city, where the people would properly appreciate the value and benefits of the electric light. The Vanderpole light was introduced to Freeport's notice one year ago last December; the parties interested in the patent rights invested some $12,000 in machinery and fittings, and at one period had some thirty lights in circuit, but this number had so dwindled down latterly that, as aforesaid, the thing could not be made to pay. Gas seems to be a good enough lighting agent for the Freeport folks.

Go Thou and Do Likewise.—Just a year ago Mr. George G. Ramsdell, Superintendent of the Citizens Gas Light Company, of Vincennes, Ind., tried the experiment of sending a copy of the Journal to each of his directors. The following from Mr. Ramsdell, dated Jan. 23, 1884, carries its own interpretation:

"We enclose New York bill of exchange for $18, to renew subscriptions for six copies of the Journal, for our board of directors. We have tried this one year, and feel amply repaid for the outlay. I recommended this course one year ago, and have been very much pleased with the benefit arising from greater intelligence in gas matters on the part of the board, and would unhesitatingly recommend its adoption by any gas company. Truly yours, Geo. G. Ramsdell, Supt."

And we have no hesitation in adding that we are indebted to Mr. Ramsdell and the Vincennes Citizens Gas Light Company for this fair and honest expression of opinion. There can be no doubt at all about the fact that the money so invested is certain to repay itself over and over again. Directors of gas companies are more apt to appreciate the value of the services of their superintendents and engineers when they (the directors) in some measure understand the nature of the difficulties (to say nothing of the complexity of the entire operation) encountered in gas making.

Cheaper Gas for East New York.—Wm. J. Ray, Superintendent of the Union Gas Light Company, of East New York, a township immediately adjoining Brooklyn city at its eastern extremity, informs us that the company reduced the price of gas, on and after January 1st, 1884, from $3 to $2.50 per thousand. It will be recollected that the management of this company passed into new hands during the last half of 1883. They are evidently setting the helm in the right direction, although $2.50 looks to us to be still a pretty high figure. However, the opening move is something.

Gas Matters at Syracuse, N. Y.—The annual meeting of the Syracuse Gas Light Company was held on January 17, and the following gentlemen were elected as a board of directors: Messrs. E. W. Leavenworth, A. A. Howlett, P. W. Forbes, Charles Andrews, George F. Comstock, D. P. Wood, J. J. Belden, Frank Hiscock, George N. Kennedy, Allen Munroe, and Thos. Molloy. The directors selected as President, E. W. Leavenworth; Vice-President, Alfred A. Howlett; Secretary, Allen Munroe; Treasurer, H. N. Babcock. The directors also did something else by way of signalizing the event, they having authorized Treasurer Babcock to make the following announcement:

"Syracuse, N. Y., Jan. 22, 1884.

"At a meeting of the board of directors of the Gas Light Company of Syracuse, held at the office of the company on Saturday, Jan. 19, 1884, it was resolved to reduce the price of gas to private consumers to $1.80 per thousand cubic feet, the reduction to take effect from March 1, the end of the present quarter. This action was taken on account of the largely increased consumption of gas by our private consumers, and will be followed from time to time, as our sales increase, by still further reductions. On and after March 1, 1884, the price of gas to private consumers will be $2 per thousand cubic feet, from which a discount of twenty (20) cents per thousand will be allowed, or $1.80 net, on all bills paid on or before the 14th day of the month on which they fall due, making the net price $1.80 per M."

It is not such a long time since that gas sold for $3 a thousand in Syracuse, and Superintendent Austin C. Wood never lets an opportunity go by of saying that the management of the Syracuse Company believed in selling gas at the lowest possible figures; and, furthermore, Mr. Wood is all the time after improvements tending to make this policy operative.

One More Unfortunate.—Malcolm Nicholson, a son of Angus Nicholson, of Quincy, Fla., visited Jacksonville, Fla., on date of Thursday, Jan. 10, and engaged a room at the Jacksonville Hotel. A strong smell of gas was noticed in the halls of the building the following day, and the proprietor of the house, Solomon Shad, instituted a search. He found a small leak in the pipe supplying gas to a stove which heated one of the bathrooms. This was remedied at once; but the odor of gas sttll prevailed. The door of room No. 12, the one occupied by Nicholson, was found to be locked, and, on being forced, the fact was revealed that the inmate had been suffocated from inhaling illuminating gas. Nicholson was quite dead, and the coroner's jury impanneled to investigate the case decided that the gas had been "blown out." Water gas is manufactured at Jacksonville, Fla.

The Market for Gas Securities.

The city gas share market maintains a strength that is really surprising, when one comes to consider the features of the general situation. Everyone knows of the long prevailing dullness and depression existing in railroad stocks and bonds, and the oft-repeated cry of millions of money being at ready command, at a merely nominal rate of interest, without anyone coming forward to borrow, but adds to the novelty of the present state of affairs. The immense amount of money paid out in the shape of interest for the half year ending January 1, has evidently not been re-invested in the usual channels; and no doubt, railroad shares and bonds having lost their attractiveness, on account of want of confidence, and the fear that bottom prices have not yet been reached, the attention of prudent investors has been turned in the direction of sound manufacturing stocks. When shares are firmly held it takes but a slight amount of inquiry to cause rapidly increasing quotations, and this sort of inquiry is in great part responsible for the figures at which city gas shares are now marked at. Manhattan gas, at its market price, 270 to 280, ex-dividend of 5 per cent. paid February 1, is not such a gold mine after all to those who buy at that notch; Metropolitan gas we quote at 225 bid—this stock is carrying a dividend of 10 per cent., recently declared and made payable February 12; Harlem gas is at 117 to 120, ex-dividend of 3 per cent. paid on 1st inst; Municipal gas higher, at 203 to 208; New York gas is steady at 150 to 152; Mutual much stronger, showing an advance of "six points" over the last recorded bid price, being now 134 to 138; Equitable gas is weaker, at 88 bid, 92 asked—the falling off in this security is partially attributable to the stoppage of work on plant on account of the inclemency of the weather, all outside building operations being at an enforced standstill; Central gas we quote at 78 to 80.

Brooklyn gas is higher at 134 to 138; Fulton Municipal weaker, at 112 to 115; Citizens fairly steady, at 88 to 91—we note a sale at auction of 100 shares of Citizens, January 31, at 90¼; Williamsburgh steady, at 113 to 115, ex-dividend of 2 per cent., recently paid; Peoples a shade off, at 70 to 71; Nassau a trifle firmer, at 76 bid; Metropolitan about same as last, 85 to 88. In other out-of-town shares we note an easier feeling in Baltimore Consolidated, now rated at 50 to 52½; Hartford gas strong and firm, at 125 bid; Washington gas steady, at 173 to 175; Jersey City gas has been sought after, but holders show no disposition to sell. We would be obliged to the secretaries of out-of-town companies if they would occasionally send us a market quotation.

Correspondence

[The JOURNAL is not responsible for the opinions expressed by correspondents.]

Some Comments on the Situation.

NEW YORK, January 24, 1884.

To the Editor AMERICAN GAS LIGHT JOURNAL:

Fourteen years ago I told the gas companies of America, through the JOURNAL (in substance) just what M. Cornuault has so carefully detailed; and if, as you observe, the past and present status of the London gas light companies be not understood in America, such want of knowledge can hardly be placed to lack of opportunity to acquire the necessary information, but is rather to be traced to a natural prejudice which tends to ignore everything English, whatever may have been the predisposing causes. The fact cannot be gainsaid that 16 candle gas is sold to-day in London (without opposition or competition) at 70 cents per 1,000 cubic feet; at this selling price a dividend of 12½ per cent. per annum is earned and paid upon a paid-up capital of $66,935,520—the single exception being the London company, which prefers the 10 per cent. dividend, and remains under the provisions of the Act of 1860. As was always known to me, and now clearly shown by M. Cornuault, the London companies are subject to no concessions—their property, in all its details, belongs to the shareholders, and their safeguards are the Acts of Parliament, which plainly and distinctly define the obligations of the companies in their dealings with the public, the relations between them being so simple that any dispute which may arise between company and consumer may be promptly disposed of by any stipendiary magistrate.

It may not be out of place to give some particulars concerning how an Act of Parliament is obtained. For instance, a company may be incorporated under the provisions of an old Act; the public may think better terms should be accorded, or the company may need new capital, or, whatever the cause, the general features of the programme are the same. Six weeks prior to the meeting of Parliament, weekly notices are inserted in the local papers stating that an application will made to Parliament for the purposes specified. If the provisions are agreed to between the company and the town council, or board of health, as the case may be, the final passage of the measure is merely a matter of pure formality; but if an agreement cannot be arrived at, the opposition may seek powers to start a new company, which will propose better terms to the consumers. A bill is printed, the preamble is read in the House, and the subject is at once referred to a special committee; this committee, after a careful hearing of the pros and cons of all the parties interested, report back to the House. The bill is then put upon its passage, or thrown out, as the case may be, or the matters in dispute may have been adjusted by the committee—in a word, equity is the principle sought after, and the results show the measure of success attending the search.

As I understand the position of American gas companies, they have hitherto always been averse to any legal obligation, consequently placing themselves outside the pale of legal protection. The gas consumers have taken no part in the matter, evidently expecting that competition must result in lower prices, without their interference. How far these expectations have been borne out the results prove. I have no hesitation in saying that every additional gas works erected in the cities of New York and Brooklyn must enhance the price of gas; and as long as the power to authorize the creation of such works is vested in the aldermen of any city, these additional burdens may always be expected.

The only apparent remedy for such a state of things, to my mind, is for the companies to unite for mutual protection, placing themselves under legal obligation, and demanding from the Legislature, in return, fair and honest protection for their rights, privileges, and property. This would prove an effectual block to the periodical attacks of raiders and "shysters."

Borrowing from a late issue of the New York *Daily World*, "They have found a panacea for the inevitable gas bill; somebody has invented a gas-holder on wheels to be sent to the natural gas wells." So we may expect, in the near future, another bonanza for the railroads who will bring to the city a regular supply of gas to be dished out to the public at popular prices. Taken in this connection, says the *World*, "Another bill was presented to the Legislature last week to reduce the price of gas to $1.50 per 1,000 feet." Suppose such a measure was passed, it could have no legal significance, as the Legislature has no more right to say what the price of gas shall be, than it has to regulate the price of tea and sugar, unless it gives, at the same time, a monopoly which the gas companies accept.

If the mayors and boards of aldermen who dispense the favors took even the slightest business view of the situation, common sense would show them that the consumption obtained by a new company is almost entirely derived from the patrons of the old company; consequently the capital invested in the apparatus becomes useless, and cannot be converted or used for any other purpose, and must remain as a monument to aldermanic folly.

There is another and more serious aspect to this indiscriminate planting of gas works in a city—viz., its sanitary condition. It is well known that a gas plant is not the most desirable institution to have next door to you—sometimes the gas works is indicted as a nuisance. I have known many such instances in the city of London. The outcome of such has been that, within the last ten years, four large works have been swept out of that city, one of which was on the banks of the Thames, still it had to go. Then, again, take the mains and services of so many companies traversing, say, Broadway; with the constant disturbance of the soil the leakage is so increased that to pass an open trench is almost sufficient to poison anyone with the intolerable stench, the subsoil being saturated with stagnant gas. This, no doubt, must add to the disease of the city, and the malaria charged to the opening of the ground is more likely to be traced to the vapors from unconsumed gas.

Yours truly, JOHN KEELING, C.E.

An Enquiry.

NEW YORK, January 15, 1883.

To the Editor AMERICAN GAS LIGHT JOURNAL:—

I would like to ask, through the columns of your JOURNAL, the opinion of some brother superintendent, as to what would be the effect on gas passing through a well charged scrubber in which a jet of steam was admitted, heating the gas at the *outlet* to say 125°, and passing then directly to the purifiers. I do not refer to the question of naphthaline, but would this treatment affect the gas with reference more especially to ammonia and sulphuretted hydrogen? Would, or would not, these be more readily eliminated by the steam than by a stream of water in the usual way?

I would also ask if a superintendent would be condemned who should interpose a coke or brush scrubber (or condenser, if the name suits bettter), without water between his hydraulic main and exhauster; or is *tar* such an excellent lubricant that the additional wear and tear on an exhauster, on account of the additional speed required to exhaust gas hot from the hydraulic direct, counts for naught if your can only flood your exhauster with tar? I would like to have both questions answered fully, to decide points at issue between myself and a fellow superintendent. Yours, etc.,

A. B. T.

[Should any of our readers see fit to send answers in response to these queries we shall publish the same in our correspondence columns.]